

AusPlots-Rangelands response to:

## **(ESA) Feedback on the draft methodology for AusPlots-Rangelands, and potential applicability to forested ecosystems**

### Introduction

We would like to thank ESA for their response and feedback on the draft Aus-Plots-Rangelands Discussion Paper. It is encouraging that ESA recognises that TERN is a significant national initiative and acknowledges that to meet our main goals is a significant logistical and scientific challenge. The early December version of the Discussion paper on which ESA commented, has undergone further consultation and considerable input has been incorporated into a more recent version which addresses many of the concerns raised in the ESA feedback. This version has now also received further substantial review and input - an updated draft will be available for comment around March 11.

Although a formal peer review process has been suggested in the feedback document we have already been through a substantial iterative peer review and feedback process, and some of the people involved in this process are listed in Appendix 1. Feedback on the Discussion Paper has been widely encouraged, and over the past 9 months we have received a wide variety of constructive feedback (including ESA reviewers) that have been incorporated into succeeding versions of the document. However, it does seem clear that the two-way communication channels between TERN and ESA could be improved. At the recent Advisory Group meeting (March 11, 2011) further comment from ESA was welcomed, and a process and timeline agreed. Initial responses to the specific points raised in the ESA feedback are provided overleaf. However, we were unclear on the meaning/implication of some of the ESA feedback (e.g. "perverse outcomes") and it would be useful to clarify these in future discussions.

### **Background**

The proposed methods are being developed for the rangelands, the arid, semi-arid and topical bioregions that cover 81% of the Australian continent. Therefore, the methods need to be widely applicable across a variety of landscapes to produce comparable baseline data with a continental perspective. Of necessity, with limited funds and project duration, the methods involve compromises at many different levels e.g. issues of scale, geographic spread, number of plots, biodiversity attributes to be measured, attributes to be included in deciding plot locations, people and organisations to be involved etc. The over-riding aim, however, is to produce a network of permanent plots across the rangelands, co-located with historic and contemporary monitoring activities where this will add value to both activities, where baseline soils and vegetation data will be measured, samples will be collected and additional survey and monitoring activities will be encouraged. Limited analysis of the samples is covered under current TERN funding and will largely depend on obtaining additional resources. Development of the methods and plot location process has been a widely collaborative process, and since July 2010 has involved input from a reference group with representatives from state, territory and federal agencies, conservation and other groups. Extensive feedback has been encouraged and incorporated through an iterative process.

The methods have been developed for use mainly in arid and semi-arid areas and to a lesser extent the tropics. They were not intended for use in forests, but were developed with the view to enabling similar types of data to be collected in other areas. The decision on suitable methods for forests will happen within TERN through the establishment of the TERN LAMPS facility and the AusPlots-Forests project during 2011. As such, the second question raised in the feedback is largely not relevant for the focus of the AusPlots-Rangelands Discussion paper and has perhaps clouded the matter. Some of the people listed in the response will be involved with this anticipated TERN - LAMPS – Forests discussion.

## **RESPONSE TO THEMATIC POINTS OF ESA-FEEDBACK:**

### **Site selection:**

- AusPlots-Rangelands plots will be co-located with existing biodiversity monitoring plots where the data is of value and is widely available. The use of a proposed ALTERP database (as indicated in the feedback) will depend on the timing of its creation.
- Discovery and incorporation of legacy biodiversity data sets is being undertaken by the TERN Eco-informatics facility, whereas our mandate is to develop the plot and methodology infrastructure across the rangelands.
- Up to 1000 plots are proposed (as detailed in the Discussion paper) and even this number will limit geographic representation. The inclusion of predicted climate-change boundary zones will reduce this further and one use of the AusPlots-Rangelands data is to assist in location of these zones.
- Site management agreements will be included for each plot and are currently being developed.

### **Stratification:**

- As well as the survey methods to be applied in the rangelands, a major aspect of the process is the considered selection of plot locations through a multi-stage stratification process. The rangelands will have up to 1000 plots.
- Replication and spatial design is being considered with arrangements being made to consult with a biometrician being appointed to TERN. It is anticipated that Bayesian statistical methods will be utilised and so issues of replication are not as critical as with traditional frequentist statistics.

### **Plot size:**

- The 100m x 100 m plots will include 1,000 intercept points and has, through our consultation and review process, been considered a necessary size to adequately characterise rangelands areas in terms of species distribution, abundance and cover.
- Conversely to some of the ESA feedback, others feel the size of the plot is actually too small to adequately represent upper stratum cover. Through a process of discussion and negotiation, the 1 ha plot size with point-intercepts has been the consensus outcome.
- Homogeneity across the plots and plot representativeness of a wider area are desirable attributes which will influence selection of plot locations.
- It is expected that plot size in forest areas will be different from that proposed for rangelands, but this will be developed over 2011 through the to-be-established AusPlots-Forests component of TERN.

### **Data variability:**

- Both data variability and reliability is addressed in the latest version.

### **Vegetation technique:**

- The wheelpoint technique has been preferred due to operator experience and because it is simple, readily repeatable and error can be reduced if methods are clearly followed (referenced in the Discussion paper).
- Data collection on annual species has now been included (from reference group feedback) and the use of basal wedge measurements (as per the Discussion paper) will provide data on basal area across the plot.
- The techniques used in the temperate forest areas may need to be adapted for dense tropical forests and this will be a factor considered through AusPlots-Forests.

### **Fauna:**

- The inability to include fauna has been disappointing for all concerned, but the decision was not made lightly. Unfortunately, it was one of the compromises made to maximise geographic and data coverage within the resourcing constraints.

- We would very much like to undertake future fauna surveys at the plots (or a sub-sample) if funding can be obtained and this option is being explored with ACRIS.
- The linkage to remote sensing was to collaborate with the TERN AusCover facility to extend its value in the rangelands and provide better spatial coverage.
- Woody debris could be measured at the plots but was not seen as a key factor in plot descriptions for arid and semi-arid systems.

#### **Soil techniques:**

- This has undergone significant change through consultation with the TERN Soils facility, ACLEP and CSIRO soil scientists.
- The technique now includes 8 holes to 30cm (in 10cm levels) and one soil core to 1m+ at each plot. Some chemical analyses will be undertaken to establish reliable calibration equations for the use of MIR and NIR techniques and collected soils will be stored at the National Soils Archive.
- Knowledge of the distribution of rangelands soils and the chemical and physical properties are poor and any data collected in the rangelands will greatly enhance the current level of information.

#### **Variables such as resilience and land condition:**

- Agree that these are difficult to quantify and can be defined very differently depending on the area of interest e.g. land condition can be very different from a pastoral or biodiversity perspective.
- After input from our reference group and others, the latest version of the Discussion Paper does not mention resilience, and condition has largely been replaced with more precise terminology.
- Since definitions of these variables vary greatly we have focused on information that is likely to inform resilience and land conditions, but have avoided commenting on them directly. This allows data to have widest possible use, with users able to utilise data to inform their own definition of condition or resilience.
- Regeneration can be inferred from plant height at the initial assessment and determined from changes in subsequent assessments.
- The inclusion of Landscape Function has been considered and data already being collected (e.g. site description and the spatial patterning of point intercept data) is being looked at as a surrogate measure.
- Additionally the new photopoint methodology that we are developing is likely to inform both regeneration and landscape function.

#### **Genetic data:**

- The field component required for the collection of material for genetic analyses is only a minor imposition beyond the collection of samples for curation. Five leaf samples of each perennial species will be stored at state herbaria for future genetic assessment when funds are obtained. This data is particularly useful to inform species distribution, biogeographic refugia and barriers and connectivity and meta-population dynamics.

#### **Data management:**

- Included in the new version of the Discussion Paper after input from reference group. It is being developed by the TERN Eco-informatics facility

#### **Good understanding of ecosystem process in the rangelands:**

- Relevant references have been considered wherever possible in developing both the survey method and the stratification process to decide site locations. Due to the size of the rangelands and the extensive areas of the different bioregions, collaboration with the TERN remote sensing facility has been promoted to facilitate the extension of point based data across wider areas. We are more than willing to consider additional references if nominated, and provided they are of direct relevance.

### **Concluding Remarks**

The survey methods and plot locations developed through AusPlots-Rangelands will involve some compromise and the advice from our reference group and management has been that our goal should be to develop as robust a system as reasonably possible, with scientific integrity, and that reasonably satisfies the greatest number of stakeholders. We are very aware that:

- The data collected needs to provide sound baselines for spatial and temporal comparisons; &
- The most important aspect of the entire process is to select plot locations that will as representative and informative as possible, so that they will be useful for additional/complementary biodiversity and other monitoring activities (e.g. pastoral) beyond the scope and timeline of TERN.

Regards

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AusPlots-Rangelands Coordinator

11 March 2011

## **APPENDIX 1: List of Scientists involved in review of AusPlots Method Discussion Paper (to date)**

Whilst these people have commented on and contributed to the methods being proposed it does not indicate that they automatically and fully approve of the methods.

Gary BASTIN, CSIRO, NT ACRIS  
Craig BAULDERSTONE, DENR SA  
Matt BOLTON, ERIN, DEWHA  
Rob BRANDLE, DENR SA  
David CANTRILL, CHAH  
Nick CUFF, NRETAS NT  
Owain EDWARDS, CSIRO WA  
David ELDRIDGE, UNSW  
Teresa EYRE, EPA, Qld  
Alaric FISHER, NRETAS, NT /ACRIS  
Mike FLEMING, DECC NSW, ACRIS  
Russell GRANT, Western CMA, NSW  
Daryl GREEN, NSW DIPNR  
Greg GUERIN, TREND Ecologist  
Mike GRUNDY, CSIRO Soils  
James HALL, DENR SA  
Alex HELD, CSIRO COSSA  
David KEITH, DEC NSW  
Ron HACKER, Industry & Investment, NSW  
Kasper JOHANSEN, AusCover, UQ  
Simon JONES, RMIT  
Gerry MAYNES, Land & Coasts DAFF  
Chris MEAKIN, DEWHA  
Dan METCALFE, CSIRO Qld  
Ladislav MUCINA, Curtin University  
Paul NOVELLY, DAF, WA  
Annette PHILIPPA, ERIN, DEWHA  
PHIL PISANO, DENR SA  
JIM RADFORD, Bush Heritage Australia  
Jasmine RICKARDS, ABARE-BRS  
Maarten RYDER, Ryder Research SA  
Peter SCARTH, DERM Qld  
Anita SMYTH, CSIRO SA  
Ashley SPARROW, CSIRO NT  
Richard THACKWAY, Manager Land & Veg Cover ABARE-BRS  
Dan TINDALL, DERM Qld  
Stephen van LEEUWEN, DEC, WA  
Glenda WARDLE, University of Sydney, & ESA NSW  
Ian WATSON, CSIRO, Tropical and Arid Ecosystems  
Peter WILSON, National Soil Info, CSIRO